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GEOGRAPHY

Intermediate and
Senior Divisions, 1988

Curriculum Guideline


Part B: Planning at the Local Level



Ministry
of
Education

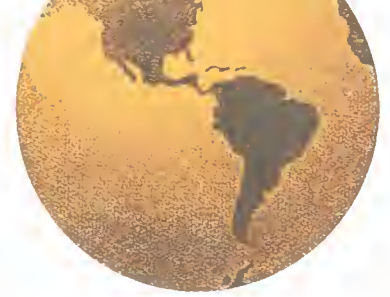
Ontario

Chris Ward, Minister
Bernard J. Shapiro, Deputy Minister

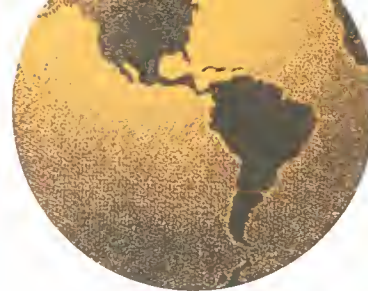


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The aims for studies in geography are based on the goals of education for Ontario. These include expectations for growth in knowledge, skills, and attitudes. All courses and units of study in schools must reflect the broad aims of this guideline and the objectives of the course outlines.

Course outlines for the Intermediate and Senior Divisions are given in Parts C, D, E, and F of this guideline. Each outline contains the following components:

– ***Course rationale and overview.*** The introduction to each course outline explains the rationale for making the course available and gives a brief overview of the major ideas to be presented in the course.

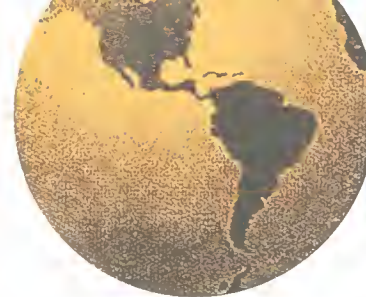
– ***Course objectives.*** These objectives are stated in general terms and involve attitudes, knowledge, and skills. It is expected that all courses developed from this guideline will provide opportunities for students to achieve the objectives listed.

– ***Course organization.*** The sections or units of the course are listed and briefly described in this part of the outline. In some outlines content units are grouped under sections. If a section is designated as “core”, then all of the units included in it must be taught. The range of time to be allotted to each section of the course is also indicated in this part of the outline.

– ***Policy and planning considerations.*** The major policy and planning considerations include explanations of and instructions on such matters as sequencing, teaching the objectives, and assessment and evaluation. In some courses requirements specific to the course under study are also outlined under this heading. The major planning considerations for the Grade 7 and 8 courses are described together.

Under the provisions of section 12 of Regulation 262, “Operation of Schools – General”, the principal of a school shall “retain on file up-to-date copies of outlines of all courses of study that are taught in the school”. Each secondary school course of study shall include at least the following information:

- the name of the Ministry of Education guideline on which the course is based
- the level of difficulty of the course
- the course’s credit value
- the course objectives
- the core content in the sequence in which it will be presented
- the evaluation practices to be used
- the resources to be used, including the title(s) of the textbook(s) and other learning materials



Each section or unit of study has been designed to relate to the guideline aims, the foundations of the geography curriculum, and the objectives for the specific course. Teachers should take this broad framework into account as they develop particular parts of a course.

The description of each section or unit of study outlined in Parts C, D, E, and F of this guideline is further subdivided as follows:

– **Section/unit rationale and overview.**

The first part of each section or unit explains the rationale for including it in the course and the major ideas to be found within it. In many cases suggestions are given regarding curriculum organization and strategies that will help to achieve the objectives.

– **Attitudinal objectives.** These objectives encompass the attitudes that students should develop as a result of taking the course. All students shall be given opportunities to develop the attitudes listed.

– **Knowledge objectives.** These objectives provide more specific direction than do the general ideas expressed in the overview. In secondary school courses objectives are identified, where applicable, for each of the three levels of difficulty. It is not intended that all knowledge objectives be studied to the same degree or for the same length of time, as some are of more significance than others.

– **Skills objectives.** Each section or unit provides skills objectives, which shall be used in conjunction with the detailed charts provided in the appendixes of this document. The only exception is in the Grade 7 and 8 courses, where a selection of appropriate skills is to be made. The length of time to be spent on the objectives and the depth of their treatment will vary with the importance and difficulty of the skill involved and the needs, capabilities, and interests of the students in a particular class. It will be important to assess students' needs, since individual levels of skill development can vary considerably. A knowledge of these individual levels of development is essential in developing appropriate growth schemes for students.

Teachers should follow a sequence as they plan a unit of study. It is suggested that they:

- establish approximate time limits based on the overall allocations for the course;
- list the concepts and generalizations that students are to understand, based on the knowledge objectives listed for the unit;

- review the descriptions regarding affective development and the skills-objectives charts on the following pages;

- incorporate activities and questions that involve the development of attitudes and values;

- design both individual and group learning activities;

- develop and refine a sequence of questions that will help students to reach conclusions;

- include ways to encourage students to pose and refine questions;

- consider resources and learning materials, both those that already exist and those that need to be developed;

- develop formative and summative assessment procedures.

The Unit-Planning Sequence

DEVELOPING COURSES AT THE BASIC, GENERAL, AND ADVANCED LEVELS OF DIFFICULTY



The suggestions included in this section are based on assumptions about the educational and career goals of students as indicated by their choice of a course at a specific level of difficulty. Teachers should keep the following points in mind in their planning:

– Students vary in their learning styles and in the rate at which they can master new concepts and skills. Therefore, information and ideas must be introduced in a variety of ways, and time allocations must be flexible enough to allow students to consolidate ideas and practise skills.

– Courses at each level should address the knowledge, skills, and affective objectives of the course as a whole. While the treatment of these objectives will be progressively more

complex for the basic, general, and advanced levels, all courses should include an appropriate treatment of the objectives outlined within the time available.

– A large variety of learning resources, including films and videos, computer programs, maps, and charts, should be used with classes at each level. Graphic resources are particularly important in helping students to understand and to respond to geography at a meaningful and appropriately complex level. Graphic presentations enable students to express themselves in ways that form and consolidate concepts and help them to present those concepts clearly and effectively.

All courses will include:

- a) a study of the foundations of geography as an academic discipline, that is, theoretical principles, concepts, perspectives, and techniques;
- b) studies of topics, areas, themes, and examples that exemplify geographic perspectives and use geographic techniques *without making these foundations explicit*;
- c) practical applications of geographic theory, concepts, perspectives, and techniques.

Although skills objectives are indicated for each level of difficulty in the course outlines, many objectives are stated in general terms and apply to courses developed at all three levels. The following suggestions and examples will assist teachers in developing the specific objectives that will be appropriate to their courses.

Table 1 illustrates the relative emphases that should be placed on life skills, content topics, and geographic concepts and processes at each level of difficulty. By keeping these emphases in mind, teachers will be able to plan appropriate learning

activities for students at each level of difficulty.
Note that all students come to understand sophisticated concepts more readily when they can use personal experience and concrete examples to relate reality to theory.

Table 1 Emphases in Courses at Different Levels of Difficulty

Focus	Basic Level	General Level	Advanced Level
1. The teaching of life skills related to the concepts and processes of geography	major emphasis	secondary emphasis	as appropriate
2. The teaching of content topics based on the concepts and processes of geography	secondary emphasis	major emphasis	secondary emphasis
3. The explicit teaching of the concepts and processes of geography	as necessary	as appropriate	major emphasis

Table 2 illustrates how the levels of difficulty might be differentiated by the relative emphasis that is placed on various items of knowledge and skills. In this example objectives have been developed for a unit on the urban economy in the Senior Division Urban

Studies course. Teachers should also consider the emphasis to be placed on each unit within a particular course in terms of the time allocations that are provided in the course descriptions in this guideline.

Table 2 The Emphases to Be Placed on Knowledge and Skills
Within a Unit at Different Levels of Difficulty

	Basic Level	General Level	Advanced Level
Key Ideas			
The origin of a settlement can usually be attributed to physical factors of site and situation.	major emphasis	major emphasis	incidental treatment
Settlements tend to form hierarchies.	incidental treatment	secondary emphasis	major emphasis
There is a relationship between the size of a settlement and its variety of functions.	secondary emphasis	major emphasis	secondary emphasis
Key Skills			
The drawing of simple sketch maps to show factors of site and situation	major emphasis	secondary emphasis	secondary emphasis
The analysis of land-use maps of urban areas to identify and explain land-use patterns	incidental treatment	major emphasis	major emphasis

Table 3 illustrates a way in which one might differentiate expectations for student achievement for the three levels of difficulty in a unit with practical, applied, and theoretical dimensions. The unit chosen for this example deals with weather as it

might be presented in a locally developed course of study in physical geography. Teachers should also be aware of the objectives for the levels of difficulty other than the one at which they are teaching. Many classes may be able to achieve objectives beyond those listed or will benefit by

achieving some that are less difficult than those listed for their level. However, summative evaluation will be based only on work done at the level chosen for the course.

Table 3 Varying Unit Objectives by Level of Difficulty

Basic Level	General Level	Advanced Level
Students will: <ul style="list-style-type: none">– take and record accurate measurements of temperature, humidity, wind speed, and barometric pressure;	Students will: <ul style="list-style-type: none">– name and explain the major elements of weather;	Students will: <ul style="list-style-type: none">– account for local patterns of weather in terms of the global pattern of air-mass formation and movement, pressure cells, and gradients;
– record and graph daily temperature readings;	– describe how data are gathered locally and over larger areas;	– sketch and label diagrams to show the passage of a low-pressure cell;
– list three sources of weather information;	– describe three recent advances in technology associated with weather forecasting;	– account for long-term variations in local weather patterns.
– know how often national weather reports are updated;	– explain the importance of accurate weather information to people such as farmers or airline pilots;	
– describe microclimatic conditions in at least two locations around the school;	– describe their own uses for accurate weather information and forecasts.	
– state two personal uses for weather information.		

In basic, general, and advanced classes, teachers are encouraged to emphasize respectively practical, applied, and theoretical approaches. The following are some examples of these different approaches to key geographic concepts. Their development here is related to absolute location and relative location as presented in the Intermediate Division Geography of Canada course.

Absolute Location

Practical approaches. Students use verbal and written instructions or sketch maps to:

- give directions for reaching a particular destination to a stranger;
- describe a route for a car rally;
- plan a trip, working from maps and schedules;
- find a specific street in a city.

Applied approaches. Students locate places using gazetteers and a variety of maps (city, provincial, atlas, topographic) and gain experience in working with a number of grid and reference systems.

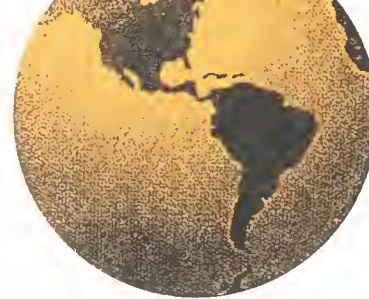
Theoretical approaches. Through the regular use of thematic, sketch, and topographic maps, students become familiar with the vocabulary, theory, and use of conventions, systems, and terms (c.g., reference points, grids, co-ordinates, compass bearings, symbols, lines) used to describe locations.

Relative Location

Practical approaches. Students gather information on how far they have to travel or how much time they spend in daily routines, such as getting to school, visiting friends, shopping, working, and recreation. They use charts, graphs, or maps to demonstrate the advantages and disadvantages of the location of their homes for their daily activities.

Applied approaches. Students are given a map of a large urban area that shows the location of three similar dwellings with significantly different market values. Students are asked to explain the differences. Given a budget for monthly rent, students must then choose a place to live and justify their choice of location.

Theoretical approaches. Students research and explain variations in residential real-estate values within their community. They prepare a list of the criteria that determine real-estate values and draw conclusions about the significance of location to price.



Pages 9–12 of Part A of this guideline describe expectations for the development of cognitive and geographic skills. The cognitive skills involved are similar to those used in the inquiry approach to learning, which is outlined in the Ministry of Education support document *Research Study Skills* (Toronto: Ministry of Education, Ontario, 1979).

Teachers must teach and reinforce the cognitive and geographic skills associated with inquiry learning to enable students to establish goals and to work effectively to achieve them. Planning for such skill development in the geography program should involve discussions:

- between teachers in the Junior and Intermediate Divisions;
- between elementary and secondary school geography teachers;
- within the organizational unit of the school;
- among teachers of related subject areas;
- between geography teachers and the teacher-librarian;
- between geography and guidance teachers.

The first step in the inquiry process is to develop a question, an issue statement, or a problem. Students must be active participants in this development. They then are guided by clearly defined procedures to answer the question, analyse the issue, and make a decision or solve the problem.

However, there is no single set or unique sequence of cognitive skills. In fact, approximately seven to twelve categories are commonly used across the disciplines to label similar types of cognitive skills. Suggestions are provided in Appendixes 1 and 2 of this document to assist teachers in developing their own model.

The cognitive-inquiry model in this guideline has eight steps:

Focus
Organize
Locate
Record
Evaluate/Assess
Synthesize/Conclude
Apply
Communicate

Each step can be developed to produce a series of objectives for student behaviour. The principles for skill growth include:

- developing student facility and confidence in using the procedures of the skill;
- developing student capability to apply the skill in more varied and complex ways;
- developing student capability to combine multiple inquiries or to organize a sequence of inquiries.

As students become knowledgeable about the steps and proficient in the procedures, they should be able to undertake a number of inquiries in sequence. For example, students undertake a comparison of two loca-

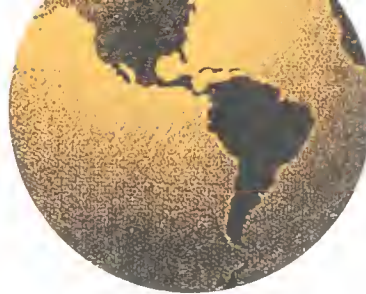
tions and then use the data to decide where they will go for a vacation.

The development of cognitive skills should include the following elements:

- the explicit teaching of the procedures or mental processes that underlie each skill (e.g., the use of verbal descriptions or charts)
- the explicit teaching of the names of the skills and examples of each skill
- the use of familiar course content to introduce a skill
- the use of course content in the development, extension, and application of a skill
- some indication of how the various skills relate to one another and how they may be used to complement one another

Appendixes 1 and 2 are based on the cognitive-skills inquiry model that is briefly summarized in Part A of the guideline. Appendix 3 provides charts for the growth of geographic skills, which are also introduced briefly in Part A.

Teachers should refer to these charts as they plan courses and units of study. Although space does not permit a detailed examination of all of the aspects of the inquiry model, examples of growth in the use of three types of organizers for an inquiry are found in Appendix 1.



Developing Self-Direction

Students form and revise their values and attitudes as their knowledge and experience expand. Studies in geography should contribute to that knowledge and experience and help students to confront questions and issues as responsible members of society.

Two broad categories of affective aims are identified in Part A of this guideline:

- those related to personal development: becoming increasingly self-directed and capable of working effectively with others;
- those related to the aims of studies in geography: maintaining healthy environments and recognizing the aspirations of others to share the benefits of progress.

In general, aims related to self-direction and the ability to work with others are achieved largely through a teacher's attitude and teaching strategies. The development of environmental responsibility and humanitarianism requires the investigation of questions, topics, and issues that are embedded in the content of each course. This section provides teachers with assistance in helping students achieve both broad categories of aims.

Students' growth is demonstrated through their increasing ability to:

- choose and define a task;
- locate appropriate information in an efficient way;
- work independently;
- organize information in logical patterns;
- present information succinctly;
- acknowledge sources correctly;
- derive satisfaction from the process and products of individual research.

To become self-directed, students must have learning choices. Teachers provide opportunities for choice when they allow students to:

- identify objectives for a unit or lesson;
- establish a focus for learning;
- choose strategies to locate, record, and assess information;
- choose ways to communicate their findings to others;
- negotiate topics and objectives for independent study;
- collaborate to establish evaluation criteria.

Teachers should make use of checklists, rating scales, and profiles to assess progress. Students will be more likely to reach the more mature stages of self-direction – valuing, application, and internalization (see the subsection entitled “Student Growth” on page 13) – if they keep track of their own progress. They can do this by developing and completing personal assessment instruments individually or in collaboration with their peers. Over time these assessments provide students with evidence that they are indeed assuming greater responsibility for their own learning.

Developing the Ability to Work With Others

Students need to be able to work with others towards the realization of common objectives. This makes it necessary to provide opportunities for them to develop attitudes such as the following:

- respect for the rights and opinions of others
- acceptance of valid suggestions and criticisms
- self-discipline
- responsibility in undertaking a fair share of the work

Specific skills that are useful in group activities need to be introduced, demonstrated, taught, and reinforced. Simple exercises should be planned to help students develop a mature attitude towards both suggestions and criticisms and to acquire the skills of observing, listening, proposing, supporting, mobilizing, organizing, negotiating, trading, persuading, confronting, rule making, reaching a consensus, and voting.

The inquiry approach provides opportunities for the development of such group skills. For example, students can share the responsibility for tasks such as the following:

- choosing and developing a topic or question for study
- brainstorming, defining, and clarifying the topic or question
- discussing the best form of organizer
- planning and carrying out the information search

- assessing the validity, appropriateness, and accuracy of the information
- achieving a consensus on the validity of the conclusions
- brainstorming the most effective ways to communicate the conclusions
- preparing materials (graphic, verbal, and written) to communicate the findings

Initial attempts at group work are more likely to be successful if students see the relevance of their contribution to the group's success. Students should be given an increasing responsibility for making decisions about the size and composition of groups for specific tasks. As well, when the results of their collaborative work are graded, they should be given some responsibility for dividing the total marks equitably.

Peer assessment is a productive method of determining progress in the ability to work collaboratively. Checklists, rating scales, and profiles are the preferred instruments for this purpose. It is the teacher's responsibility to ensure that the evaluation criteria are stated in clear and objective terms and are related to individual contributions to the project rather than to personal preferences or popularity.

Developing Environmental Responsibility and Humanitarianism

Course and unit descriptions identify specific affective objectives that are related to the environment and to the aspirations of other people. There is no shortage of topics with affective dimensions. At the local level these include the quality of housing, accessibility of services, and appropriate use of land. World issues, such as urbanization, population growth, resource depletion, and disparities in wealth, affect millions of people and ultimately each student. Realistic explanations of the processes that have created such issues must recognize that decisions reflect the values and attitudes of the decision makers.

When teachers include affective objectives in units of study, they must consider how student feelings, attitudes, and values can be developed. Students should be expected to consider situations and issues with fairness, objectivity, and tolerance for a variety of viewpoints. They should recognize the validity of both subjective and objective observations. They should also be able to identify, investigate, and evaluate alternative explanations for unemployment, underdevelopment, poverty, wealth, revolution, and war. As well, they need to recognize and accept responsibility for overcoming racism, sexism, inequality, and injustice in their own personal lives.

Teachers should involve students in activities that require them to exercise both intuitive and analytic judgement. Sample studies and simulations provide many opportunities to do this.

Student Growth

Growth in the development of appropriate attitudes and values is usually described as a series of stages through which an individual proceeds towards maturity. Teachers will find such a hierarchy of stages a useful guide in the planning of units and lessons. A typical hierarchy labels the stages as awareness, appreciation, valuing, application, and internalization. These are defined as follows:

- **awareness.** The student learns about the existence of a situation or issue.
- **appreciation.** The student takes an interest and becomes involved in the topic.
- **valuing.** The student develops personal, consistent, and defensible attitudes towards the problem.
- **application.** The student is able to organize his or her opinions and beliefs; he or she may have to rank, and perhaps adjust, his or her values.
- **internalization.** The student acts consistently, can explain and justify beliefs, and can place them in the context of a larger value system.

When applied to a broad affective objective such as “To develop concern and respect for the environment”, the stages might be described as follows:

- **awareness.** The student is aware of the benefits of a clean environment.
- **appreciation.** The student begins to take an interest in the environment and to appreciate the problems caused by pollution.
- **valuing.** The student articulates values about the environment, taking and defending a position.
- **application.** The student recognizes the environmental impact of an action or issue, becomes involved in issues, and designs programs to publicize the dangers and to suggest remedies.
- **internalization.** The student is able to analyse environmental issues and supports views consistent with his or her own principles, encouraging others to become involved as well.

Note: There are many situations in which students will take no action, because the application and internalization stages may not always be possible within the study under way.

Course outlines provide broad attitudinal objectives for the units of study. Table 4 provides examples of questions that can be used to direct students to the significance of attitudes and values. To see the relevance of table 4, teachers should apply the questions to specific examples such as the following:

- Proposals are made to close a school, build a shopping plaza outside the town limits, or shut down a refinery.
- A newspaper article describes Native people picketing a logging site, qualified immigrants having difficulty obtaining jobs, or a delegation to the city council opposing the location of a group home in its neighbourhood.

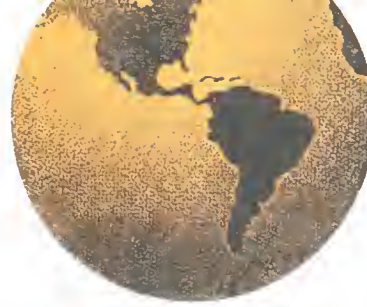
Table 4 Sample Questions to Use in Affective Development

Stages	Typical Questions
awareness	What is going on here? Why is this an issue or problem? What do I need to know to understand the situation better?
appreciation	If this happens, who will be affected? In what ways? What are the processes by which decisions are made? How would I feel: a) if I were the decision maker? b) if I were affected by the decision?
valuing	Who are the decision makers? On what grounds are they likely to make their decisions? What seem to be their values and attitudes? What alternative courses of action are possible? What are the advantages of each? What action would I take: a) if I were the decision maker? b) if I were affected by the decision?
application	What action should the decision makers take? Why? What effect would the action have on the environment or on the people involved? If I were making the decision: a) could I support this as the best action on the question or issue? b) what action could I take? c) what would be the likely consequences of my action?
internalization	In the future how will I make decisions: a) on issues related to the preservation of the environment? b) on issues related to the equal treatment of others, regardless of sex, race, creed, or colour?

Through such a process students become aware of their own attitudes, values, and beliefs as well as those of others. In their studies of other people and places, students will encounter value systems quite different from their own. Their studies should make them sensitive to the issues involved in the human use of the environment and the aspirations of others.

The teacher's responsibility is to develop learning activities that will enable students to recognize values issues and to acquire the knowledge and skills required to deal with them in thoughtful ways.

As noted in Part A of the guideline, assessment of a student's progress in affective development is seldom easy, nor can it be a significant factor in summative evaluation. Teachers must be cautious, however, not to assume that only that which is easily measured is important.



In this guideline the terms *assessment* and *evaluation* have specific meanings:

– **Assessment** involves the gathering of information on student progress and achievement through the use of a wide variety of instruments and techniques.

– **Evaluation** is the consideration of the information gathered to make instructional decisions or to assign marks.

Students should be informed at the outset of a course and reminded at appropriate times of the following:

- the objectives of both the course and of each unit in the course
- the aspects of the course that will be assessed
- the methods of assessment that will be used
- the way in which all summative marks or grades will be determined on the completion of the course (i.e., the weight of the various evaluations that are included in the final mark or grade)

Teachers must ensure that:

- the unit mark, as a percentage of the final mark, properly reflects the weight or significance of the unit;
- each kind of objective (knowledge, skill, attitudinal) receives an appropriate weighting; the proportion will depend on the grade and level of difficulty of the course;
- assessment techniques provide equal opportunity for all students to demonstrate what they have achieved;
- assessment supports an appropriate level of student growth in self-confidence and self-concept;
- students become progressively more capable of self-evaluation;
- opportunities are provided for peer evaluation;
- assessment techniques recognize the future educational and career plans of students.

Teachers must be familiar with a variety of assessment techniques in order to deal effectively with the range of learning objectives and levels of difficulty. The purpose of an assessment determines the choice of instrument. Teachers should understand the advantages, disadvantages, and uses of each. The following are five types of assessment techniques:

Informal techniques. The assessment of a student's ability does not necessarily involve formal testing. A portion of students' marks should reflect their actual performance of skills, as well as the products of learning activities. The careful observation of the quality and frequency of students' participation and the regular marking of assignments are only two of the techniques that teachers can employ to obtain important information regarding the knowledge, skills, and attitudes of their students. These two methods of gathering information often provide better indicators of progress and achievement than more formal procedures; they are also important in developing self-direction and interdependence in students.

Informal techniques of assessment are useful for all classes but are of particular value for those in the Intermediate Division and those given at the general and basic levels of difficulty. The nature of the attitudinal, knowledge, and skills objectives varies from course to course, and this greatly influences the appropriate use of these forms of assessment. In all classes the percentage of the final mark to be assigned to informal techniques of assessment will have to be carefully determined.

Essay questions and reports. Essay questions enable students to respond in a variety of ways, such as writing, drawing a map, or designing a table, chart, or graph. They may also differ significantly in difficulty and complexity.

It is valuable to refer to a taxonomy of objectives in setting essay questions. This enables the teacher to plan questions that require the specific mental operations entailed in higher-order thinking processes. All essay questions should meet the following criteria:

- The question or task should be consistent with the objective being assessed.
- The form of the question should reflect the way in which the material or skill was taught.
- The task should be clear to the student.
- The student should be able to determine precisely when the task has been completed.

Objective tests. Objective tests assess a student's capability to perform a wide variety of tasks quickly and efficiently. Most objective-type questions have only one right answer and therefore can be marked quickly and accurately. The Ontario Assessment Instrument Pool includes a large number of such questions, which have been designed for certain courses in geography. Objective tests may include analogy, multiple-choice, one-word-response, matching-items, and true-or-false types of questions.

Questionnaires. Questionnaires, checklists, rating scales, participation charts, and similar instruments enable teachers to monitor student growth, particularly in the development of skills and in the affective domain. Well-designed instruments are useful in revealing student learning styles and interests. These instruments may be administered by teachers, students' peers, or colleagues. Teachers may also interview individuals or small groups to gather information.

Formal examinations. There is a great variety of opinion and practice regarding formal examinations. However, generally examinations are of a more comprehensive nature than are other forms of assessment, are summative in nature, and require a longer period of time to complete than do the other more informal testing techniques that are used during the term of a course.

A great variety of questions should be used in examinations. These should be chosen so that they measure the objectives covered in the course or parts of the course being tested and are related to the style of the teaching and learning techniques employed in the presentation of the course. It is important that the weighting of the parts of a formal examination be appropriate to the content components that it examines.

From 25 to 35 per cent of the final mark of any Ontario Academic Course in geography must be based on formal examinations. However, formal examinations should not be given undue emphasis in the years leading to the OACs. Individual course descriptions at all grade levels should indicate the relative weight to be assigned to formal examinations in the determination of the final mark.

APPENDIX 1: COGNITIVE-SKILLS GROWTH – ORGANIZING INFORMATION



Introduction

In the inquiry-skills development model an “organizer” is developed after the focus of the inquiry has been clearly established. An organizer attempts to organize the data under study in a visual way, so that the relationships among various factors can be more readily recognized, understood, and interpreted. Organizers may take the form of a chart, a table, a graph, a flow diagram, a matrix, or, at the advanced level, a set of relationships expressed in mathematical symbols.

The success of an inquiry is often dependent on how well one can structure the organizer or visual representation in order to illustrate the major problem or topic elements and their relationships to each other. The development of an organizer brings knowledge and skills together; it helps students and teachers to visualize the task and provides direction to the inquiry. In addition, the organizer, by the very nature of its framework, assists the learner in relating information to the focus as he or she proceeds

with the various processes of locating, gathering, analysing, and communicating information. Not only will an organizer facilitate the learning, recall, and understanding of the topic under study, but its use will also improve the quality and logical organization and increase the productivity of student writing. Organizers prompt students to generate new and often clearer ideas, as well as to analyse relationships.

Organizers also help the teacher to see the student growth that is taking place. While the examples used in this appendix are of a general nature, teachers may make the data as detailed and specific as they wish. An examination of growth in one dimension of inquiry skills will reveal corresponding growth in the development of other skills. For example, the introduction of an alternative into a decision-making organizer requires the location and analysis of other information. This, in turn, may require a re-examination of the focus to see if its emphasis needs to be changed.

Three dominant types of organizers used in geographic studies are briefly outlined in this appendix. These are the organizers used for comparison, correlation, and decision-making purposes. For each type of organizer separate examples are given for students in Grades 7 and 8, Grades 9 and 10, and the Senior Division. The degree of sophistication used with any particular class will have to be determined by the teacher, who best understands the abilities of the students.

Comparison Organizers

Comparison organizers are designed to enable students to recognize and understand more clearly the similarities and differences between any two or more selected items. In the examples below a comparison is made between northern Ontario and southern Ontario in regard to a number of characteristics.

Comparison Organizer for
Grades 7 and 8

The following is one logical frame-
work that could be used for a compar-
ison organizer for Grades 7 and 8.

Purpose: To compare the characteris-
tics of northern and southern Ontario

Characteristics for Comparison	Areas to Be Compared	
	Northern Ontario	Southern Ontario
Location		
Size (area)		
Population		
Landforms		
Vegetation		

Rather than starting with this sys-
tematic framework, the teacher could
start by asking students for informa-
tion that they already have about
either area, collating these ideas on a
chalkboard or flip chart as they are
suggested. A systematic chart could
then be developed through a class
discussion of the various characteris-
tics that students' ideas suggest. These
could then be placed on a chart like
the one above. Once that is complete,
the differences and similarities be-
tween the two regions become more
clearly defined.

**Comparison Organizer for
Grades 9 and 10**

The complexity of the comparison should increase in Grades 9 and 10. In the following example the entire comparison is related to an overall theme or question, that is, how the characteristics or factors help to explain the human use of land and resources in the two regions under study. As a result cause-and-effect relationships between characteristics such as transportation and landforms or agriculture and climate will be analysed rather than merely described.

Purpose: To compare northern and southern Ontario with regard to the factors affecting the human use of land and resources

Characteristics for Comparison	Areas to Be Compared	
	Northern Ontario	Southern Ontario
Locational		
Physical		
Historical		
Economic		

Another complexity that could be added to comparisons in Grades 9 and 10 is the examination of a greater number of factors than were examined in Grades 7 and 8. For example, the aspect of vegetation, suggested for the earlier grades, could be expanded to include several subdivisions under the broader topic of natural resources. This might appear in a chart such as the one on the following page.

Characteristics for Comparison	Areas to Be Compared	
	Northern Ontario	Southern Ontario
Natural resources		
– Trees	|||||	|||||||
– Fish	|	
– Animals		|||||||
– Minerals	×	
– Soil		|||||||
– Water	|||||||	|||||||

The specific purpose of the inquiry will govern what information is important and what criteria should be applied. For example, a farmer considering a location to establish an apiary would seek quite different information and apply different criteria than a citizen considering where to go on vacation. Students may need to seek out and use specialized sources and forms of information to complete their inquiry.

Comparison Organizer for the
Senior Division

In this example there is an increase in the quantity and quality of the data expected.

Purpose: To determine whether northern and southern Ontario should have similar approaches to economic development

Characteristics for Comparison		Areas to Be Compared	
		Northern Ontario	Southern Ontario
Location	absolute		
	relative		
Resources	natural		
	human		
Goals	social		
	economic		
Infrastructure	physical		
	financial		
Environmental issues	air		
	water		
	land		
Other factors (from teacher or students)			

Correlation Organizers

Geographers recognize that the study of relationships is at the core of the discipline. Correlational organizers are designed to show how changes in one or more variables are linked to changes in another variable. In the examples below the yield in corn is related to an increase in precipitation.

Correlation Organizer for
Grades 7 and 8

Purpose: To see whether there is a correlation (or relationship) between the amount of spring rain received in different years and the yield of the corn crop

Year	Spring Rain	Corn Crop
1987	heavy	excellent
1986	average	good
1985	heavy	good
1984	light	fair
1983	light	poor

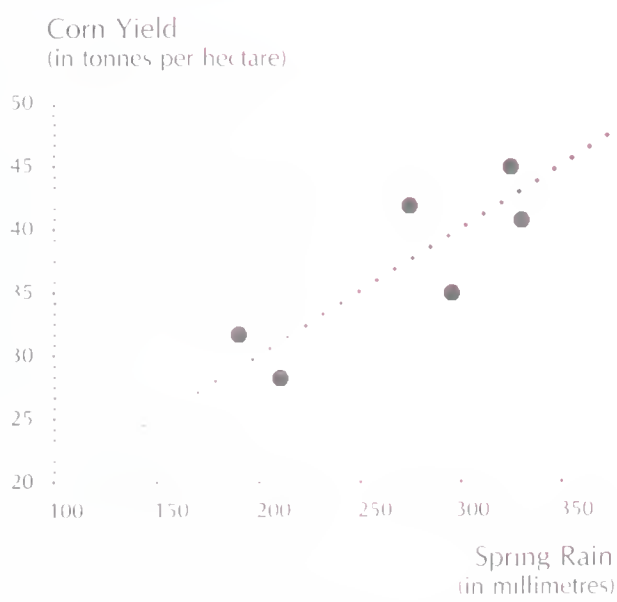
Through the study of this generalized type of data, students could see that there seems to be a connection between the precipitation received in the spring and the general descriptions of the success of the crop. The data are not precise, and students should realize that the relationship is not perfect because other factors (temperature or number of rainfalls and their timing) could also influence the yield.

Correlation Organizer for
Grades 9 and 10

In Grades 9 and 10 the correlation organizer should become more complex, and the use of more specific mathematical relationships could be introduced. In addition, it is suggested that scattergrams be introduced to make a visual, specific representation of the relationships between the variables.

Purpose: To show the correlation between the yield of corn and the amount of spring rain received

Year	Spring Rain (in millimetres)	Yield (in hectolitres per hectare)
1987	320	45
1986	275	42
1985	296	35
1984	325	41
1983	190	32
1982	212	28



● represents plotted locations on the graph.

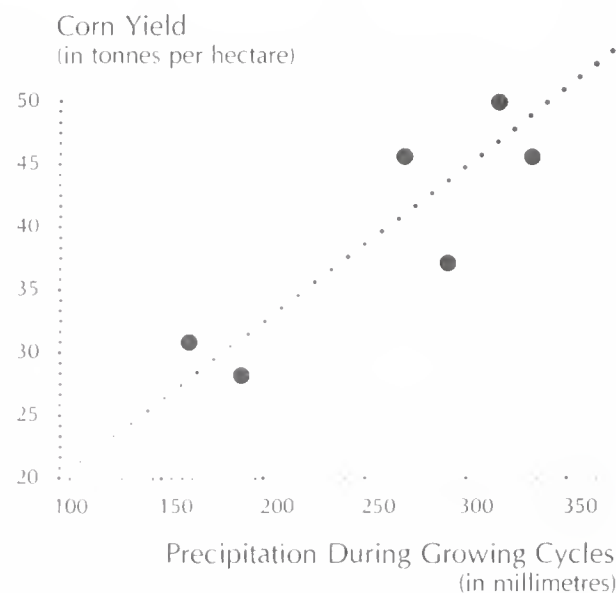
The data on the scattergram help students visualize and understand how the change in one variable affects the other. The trend of the directional axis can be established and drawn so that approximately the same number of dots lie on either side of the axis.

Correlation Organizer for the Senior Division

In the Senior Division correlations among corn crops at various locations that vary in terms of the available heat are used as examples. By producing three graphs (similar to the one illustrated here) for three locations within a corn belt, students can examine the effect of an additional variable, temperature, on the relationship between the variables under study.

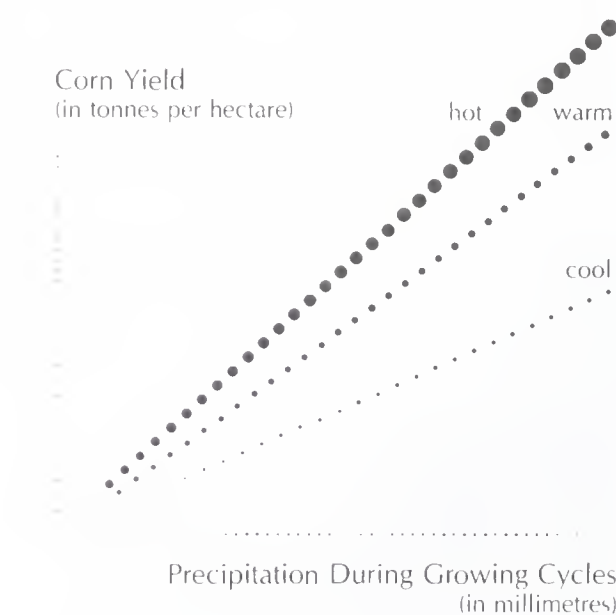
Purpose: To determine at several locations the specific relationships between the precipitation received during the growth cycle and the yield of the corn crop

Warm Locations (middle third in heat units)



● represents plotted locations on the graph.

By combining their three graphs on one scattergram, which also includes the cool and hot locations, students will obtain an even fuller picture of the relationships among the factors.



Such a scattergram could be compared with one showing the spring-rain conditions only, so that a fuller examination of the correlations could be made.

Decision-Making Organizers

Decision-making organizers, sometimes referred to as "issue-analysis organizers", should give students a technique for analysing issues, thus enabling them to reach a decision or action plan. These organizers help students to recognize the various and possibly conflicting factors in an issue. They also simplify the process of decision making, since the organizers highlight the significant criteria that should be considered for each alternative.

One simple but often revealing technique that might be used in connection with the decision-making organizer involves constructing a simple chart similar to the main organizer after its criteria have been filled in. A plus, indicating a positive factor, or a minus, indicating a negative one, is then assigned to each criterion. The pluses and minuses under each alternative are added together, and the tally is used as the basis for a decision. Students must be warned, of course, that such a tally is quantitative only and that qualitative assessments (or a determination of the weight or value of each factor) are critical in decision making.

**Decision-Making Organizer for
Grades 7 and 8**

Purpose: To make a decision regarding
which source of energy would be most
suitable for heating a home

Criteria by Which to Judge Alternatives	Alternatives		
	Oil	Natural Gas	Electricity
Source			
Fuel cost			
Convenience			
Reliability			
Cleanliness			
Space requirements			

Decision-Making Organizer for
Grades 9 and 10

An organizer similar to the one used above could be used for Grades 9 and 10. However, the number and specificity of the criteria to be studied will increase.

Purpose: To study or make a decision regarding alternative sources of energy for heating a home

Criteria by Which to Judge Alternatives	Alternatives		
	Oil	Natural Gas	Electricity
Costs			
– installation			
– maintenance			
– replacement			
Convenience			
– dirt			
– noise			
– space			
Security of supply			
– short-term			
– long-term			
– government policies			
Potential for combining sources			
– with wood			
– with electricity			

Decision-Making Organizer for the Senior Division

In the Senior Division both the complexity of the issue and the quantity of the data researched should increase. In addition, the decision to be made may be at a broader or more abstract level. In the accompanying example a decision at the federal government level is examined so that national policy directions might be established.

Purpose: To determine the mix of energy supply that the federal government of Canada should encourage

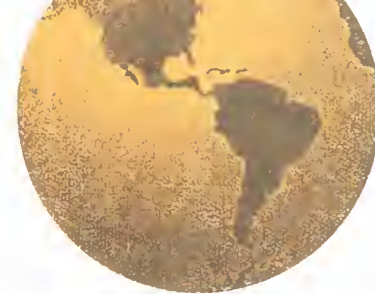
Criteria by Which to Judge Alternatives	Alternatives				
	Oil	Natural Gas	Hydro-electricity	Nuclear Energy	Coal
Present breakdown					
Domestic production					
Domestic reserves					
Short-term factors					
– cost					
– job creation					
Long-term factors					
– cost					
– job creation					
– waste disposal					
Security of supply					
Regional considerations					
Possible problems					
– supply disruption					
– world economy					

Conclusion

Because of the great number of factors involved, students may find it desirable to rank the factors in importance or to highlight in some way those that are the most critical (e.g., those that would have the greatest economic or political impact) in coming to a decision.

A review of the examples provided for the three types of organizers will show that there are many opportunities to expand each section of the charts, to enhance the skills introduced at an earlier level, and to ensure that there is a constant growth as the year progresses and as students move from one grade level to another.

It may be that students will not be able to fill in the required data for all of the criteria outlined; however, the gaps will identify areas that require fuller investigation. Expectations for student growth in inquiry skills are reflected in the increase in the degree of sophistication of treatment established for each study in successive grades. The major dimensions of such growth are reflected in the number of factors studied, the degree of judgment involved in weighting them, the extent to which they are subdivided and made more specific, and their degree of subtlety.



The following charts provide recommended inquiry activities to develop cognitive skills for Grades 7 and 8, Grades 9 and 10, and the Senior Division, including Ontario Academic Courses. The purpose of these charts is to help students:

- develop the range of skills and competencies that are required for geographic inquiry as well as for a wide variety of other contexts;
- develop and enhance their skills in written and graphic communication.

Students should build on the knowledge and skills that they have acquired in earlier grades. Since the learning styles as well as the abilities of students differ, teachers should select cognitive skills that reflect these differences in styles and abilities.

The following charts are based on the cognitive-skills inquiry model briefly developed in Part A of the geography guideline. They build on the level of skill development that students have achieved in the Junior

Division. The amount of assistance that students require will vary and will decrease as they mature and gain experience.

Teachers should consult with the teacher-librarian in planning the use of resources within both the school and the community. As much as possible, teachers should make use of current communications technologies in locating and retrieving information pertinent to topics. Computer technology, for example, can make it possible to present and manipulate data so that patterns, trends, and relationships become clear.

Three terms are used in the following charts to indicate differences in the treatment of each of the steps in the cognitive-skills inquiry model:

- *introduce*. The student experiences and uses the skill in a geography context for the first time and has some structured opportunities to practise it.
- *develop*. The student is able to identify the skill and the procedures it entails and now applies the skill in increasingly complex contexts.
- *extend*. The student has mastered the procedures of the skill, has experienced it in several contexts, and now applies the skill to multiple inquiries with appropriate independence.

In any inquiry, the student normally follows the steps in sequence. As an inquiry proceeds, however, it may be necessary to return to an earlier step because the information being gathered is not meeting the needs of the inquiry. When the inquiry has been refocused, the sequence is resumed at the appropriate step.

Focus. Students should be able to formulate suitable questions for each type of cognitive inquiry.

Students shall be provided with opportunities to:

Suggested Treatment of the Skills

	Grade 7	Grade 8	Grades 9 and 10			Grades 11 and 12			OACs
			B	G	A	B	G	A	
– discuss the purpose and quality of questions;	I	I	D	D	D	E	E	E	E
– generate and examine a variety of questions on a topic;		I	I	D	D	D	E	E	E
– select the best questions to develop an inquiry;	I	I	I	D	D	D	E	E	E
– differentiate between factual, definitional (conceptual), comparative, correlational, and decisional questions;		I	I	D	D	D	E	E	E
– rate the quality of questions on a list, using pre-established criteria;				I	I		D	D	E
– formulate new questions that meet pre-established criteria.					I			D	E

I – introduce

D – develop

E – extend

Organize. Students should be able to select and develop a suitable organizer for the inquiry. This organizer or framework should show the elements of the inquiry and the relationship among these elements.

Students shall be provided with opportunities to:

Suggested Treatment of the Skills

	Grade 7	Grade 8	Grades 9 and 10			Grades 11 and 12			OACs
			B	G	A	B	G	A	
– use organizers (e.g., concept-clarification, mapping, model-building, comparison, correlation, timeline, and decision-making organizers) to structure an inquiry;	I	D	D	D	D	E	E	E	E
– develop an appropriate organizer for an inquiry;	I	I	I	D	D	D	E	E	E
– re-examine and revise the inquiry focus to reflect the organizer as necessary;	I	I	I	D	D	D	E	E	E
– develop organizers that enable multiple inquiries.		I	I	I	D	D	D	E	E
	I – introduce		D – develop			E – extend			

Locate. Students should be able to locate and select appropriate information.

Students shall be provided with opportunities to:

Suggested Treatment of the Skills

	Grade 7	Grade 8	Grades 9 and 10			Grades 11 and 12			OACs
			B	G	A	B	G	A	
– identify appropriate sources of geographic information;	I	I	I	D	D	D	E	E	E
– use reference tables, such as a table of contents, a title page, an index, a glossary, and cross-references;	I	I	I	D	D	D	E	E	E
– acquire information in various ways (e.g., by asking, reading, observing, sampling, and counting) according to a pre-established plan;		I	I	I	D	D	D	E	E
– compare the purpose and coverage of different publications, such as newspapers, magazines, and pamphlets;				I	I	I	D	D	E
– use a variety of reference sources;		I	I	D	D	I	D	E	E
– use a variety of information-access and cataloging materials;		I	I	D	D	I	D	E	E
– select appropriate information;	I	I	D	D	D	D	E	E	E
– evaluate the reliability of information sources;				I	I	I	D	D	E
– evaluate the quality of information from various sources, using pre-established criteria;				I	I	I	D	D	E
– relate information to the organizer used for the inquiry;	I	D	D	D	D	E	E	E	E
– compare the cost-benefit factors of alternative reference sources in terms of such criteria as time, travel costs, and relevance.				I	I		D	D	E

I – introduce

D – develop

E – extend

Record. Students should be able to summarize and record information based on an organizer.

Students shall be provided with opportunities to:

Suggested Treatment of the Skills

	Grade 7	Grade 8	Grades 9 and 10			Grades 11 and 12			OACs
			B	G	A	B	G	A	
– identify the main ideas and supporting ideas in information;	I	I	I	D	D	D	E	E	E
– summarize information;	I	I	I	I	D	D	D	E	E
– select appropriate supporting information in a variety of formats (e.g., pictures, maps, graphs, diagrams, sketches, data bases);	I	I	I	D	D	I	D	E	E
– produce appropriate supporting information in a variety of formats (e.g., pictures, maps, graphs, diagrams, sketches, data bases);	I	I	I	D	D	I	D	D	E
– relate information to the logical structure produced by the focus and organizer.	I	D	D	D	D	E	E	E	E

I – introduce

D – develop

E – extend

Evaluate/assess. Students should be able to evaluate and assess the recorded information.

Students shall be provided with opportunities to:

Suggested Treatment of the Skills

	Grade 7	Grade 8	Grades 9 and 10			Grades 11 and 12			OACs
			B	G	A	B	G	A	
– identify the topic in information gathered;	I	D	D	D	D	E	E	E	E
– relate the information gathered to the topic or focus;	I	D	D	D	D	E	E	E	E
– distinguish between fact and opinion;		I	I	D	D	I	D	E	E
– identify bias and point of view in information;				I	I	I	D	D	E
– determine the relevance of information to the focus;		I	I	I	I	I	D	D	E
– determine whether additional information is needed;				I	I	I	D	D	E
– determine which opinion is best, according to the evidence;					I			D	E
– evaluate information for logical fallacies.					I			D	E

I – introduce

D – develop

E – extend

Synthesize/conclude. Students should be able to synthesize and draw conclusions.

Students shall be provided with opportunities to:

Suggested Treatment of the Skills

	Grade 7	Grade 8	Grades 9 and 10			Grades 11 and 12			OACs
			B	G	A	B	G	A	
– observe relationships in the data;	I	D	D	D	D	E	E	E	E
– draw conclusions based on observations;	I	D	D	D	D	E	E	E	E
– supply evidence to support conclusions and opinions;	I	I	I	D	D	D	E	E	E
– assess the usefulness of conclusions;				I	I	I	D	D	E
– determine the appropriateness of the method and materials used to reach conclusions;					I		I	D	E
– explain their own opinions, using evidence for support;		I	I	I	D	D	D	E	E
– draw conclusions based on the systematic evaluation of evidence;					I		I	D	E
– weigh alternative conclusions critically and systematically;					I		I	D	E
– modify conclusions based on new evidence.				I	I	I	D	D	E

I – introduce

D – develop

E – extend

Apply. Students should be able to apply the product and process of the inquiry to other situations or circumstances.

Students shall be provided with opportunities to:

Suggested Treatment of the Skills

	Grade 7	Grade 8	Grades 9 and 10			Grades 11 and 12			OACs
			B	G	A	B	G	A	
– make accurate generalizations and predictions from conclusions;	I	I	D	D	D	E	E	E	E
– apply a generalization to a specific case(s);	I	I	I	D	D	D	E	E	E
– use conclusions in different types of inquiry;				I	I		D	D	E
– speculate about alternative outcomes;				I	I	I	D	D	E
– determine practical uses of conclusions;	I	I	I	D	D	D	E	E	E
– determine practical uses of the skills used in different types of inquiry;	I	I	I	D	D	D	E	E	E
– make appropriate analogies from conclusions;				I	I	I	D	D	D
– create or adapt alternatives to the inquiry process that was followed.					I		I	D	D

I – introduce

D – develop

E – extend

Communicate. Students should be able to communicate the product and process of the inquiry.

Students shall be provided with opportunities to:

Suggested Treatment of the Skills

	Grade 7	Grade 8	Grades 9 and 10			Grades 11 and 12			OACs
			B	G	A	B	G	A	
– determine the appropriate mode of communication: oral, written, or graphic;	I	I	I	D	D	D	E	E	E
– communicate in a manner consistent with the purpose of the inquiry;	I	I	I	D	D	D	E	E	E
– use support materials (c.g., charts, graphs, maps, pictures) in assignments and in records;	I	I	I	D	D	D	D	D	E
– write appropriate, coherent records;	I	D	D	D	E	D	E	E	E
– speak coherently and correctly about a topic in a variety of situations;	I	I	I	I	D	I	D	D	E
– prepare and use notes in presenting an oral report;	I	I	I	I	D	I	D	D	E
– keep to the point of a discussion;				I	I	I	D	D	E
– write descriptions and explanations of points of view;				I	I	I	D	D	E
– write explanations of relationships;	I	I	I	D	D	D	E	E	E
– write to persuade;		I	I	D	D		D	E	E
– find examples of references and footnotes and discuss their uses;				I	I		D	D	E
– include references in essays;				I	I		D	D	E
– describe, explain, and persuade orally;	I	I	I	I	D	I	D	D	E
– prepare bibliographies and footnotes.							I	I	D

I – introduce

D – develop

E – extend



In geographic studies graphic techniques are used to show information such as shape, location, distance, amount/volume/quantity, change, flow, distribution, relationships, and interaction. The following chart indicates forms of communication that are appropriate for such purposes. The chart relates to the geographic-skills chart on page 12 of Part A of this guideline and has applications in the locating, recording, and communicating stages of the basic inquiry model outlined in Appendix 2.

Teachers should note the following:

- The emphasis throughout these charts is on interpretation and communication.
- The skills taught at one grade level need to be reviewed and extended in succeeding levels. This is indicated by the progression of dots in the chart.
- A skill should not be taught in isolation. Rather, students should recognize the skill as being personally useful. This is best achieved by introducing or using the skill within a geography unit, so that the skill has purpose.
- The skills are spread over a number of years in the chart in order to assure that there is a broad base of responsibility for them. However, the chart is not intended to be limiting. Many of the skills could be introduced at an earlier grade level than the one indicated on the chart.
- Some of the skills assigned to the Grades 7-8 column may be familiar to students from their Junior Division program.

- Teachers should make use of the many possible opportunities to integrate a variety of mathematics skills into the program.

Recommended geographic-skills objectives are provided in this appendix for the following topics: maps; map projections; scale and distance; direction; location; symbols; pattern; observation and research techniques (field studies, ground photographs, air photographs, and topographic maps); charts, graphs, and tables; diagrams and models; time and chronology; and research.

Maps. Maps are the essential tools of geography. They communicate vast amounts of information in symbolic form. Most of the skills described below relate to the use of maps.

Grades 7–8

Students should be able to:

- secure information from a wide variety of maps, including thematic (physical, political, distribution) and symbolic (dot, flow, choropleth) maps.

Grades 9–10

Students should be able to:

- make comparisons by examining information from several maps.

Senior Division

Students should be able to:

- interpret multipurpose maps such as topographic and weather maps.

Map projections. A map is an attempt to represent on a flat surface an area of the earth from the globe. Every map projected from the globe is distorted to some extent. While the cartographer strives for accurate shape, area, distance, and direction in maps, compromises must be made.

Grades 7–8	Grades 9–10	Senior Division
Students should be able to:	Students should be able to:	Students should be able to:
– locate the same landform feature or country on the globe and on maps drawn from several projections;	.....
– determine the location of north on maps drawn from a variety of projections;	.....	– recognize the projections used as the bases for various atlas maps encountered throughout the course;
– describe the advantages and disadvantages of using the globe as a source of information;	.....	– identify principles related to the construction and use of three basic types of projections: cylindrical, conical, and azimuthal;
– describe the advantages and disadvantages of maps as sources of information;	– recognize that all maps are derived from the globe and that each map type has its limitations and its uses;	– determine the best projection for a specific purpose;
		– classify maps according to three qualities: a) equality of area – every part of the map has the same area as does the globe at the same scale; b) correctness of shape – every small area on the map has the same shape as it does on the globe; c) true direction – true compass direction is given from a point on a map to any other point;
– use a variety of maps, especially the types that appear in newspapers.	– determine the best map for a specific purpose.	– select a map projection to serve specific purposes, such as the following: a) showing great circle routes; b) plotting the distribution of world phenomena; c) showing a small or large area; d) giving accurate distances; e) depicting shape accurately; f) showing a specific city as the focus.

Scale and distance. Scales are used to show actual sizes, shapes, and distances on the earth’s surface.

Grades 7–8	Grades 9–10	Senior Division
Students should be able to: <ul style="list-style-type: none">– use small objects to represent large ones (e.g., an airplane model, a photograph, a map);– understand that the scale of a map governs the amount of information that can be shown on it;– determine distances on a map, using a graphic or linear scale;– use statement scales and graphic (or bar or linear) scales;– locate the same area on maps drawn to different scales;	Students should be able to: <ul style="list-style-type: none">– suggest uses of maps drawn to large scales and of those drawn to small scales;– use representative fractions or ratios;– convert representative fraction scales to statements of scales;	Students should be able to: <ul style="list-style-type: none">– compare the degree of detail that can be included on maps drawn to different scales;– describe uses of each of the map scales in Canada’s National Topographic System (1:25 000, 1:50 000, 1:125 000, 1:250 000, and 1:500 000);– calculate the approximate scale on a given map;

Scale and distance (continued)

Grades 7–8	Grades 9–10	Senior Division
<ul style="list-style-type: none">– measure the distance between two points on a map, using the graphic scale;	<ul style="list-style-type: none">– use the statement scale of a map as the basis for calculating distance;– measure both straight and winding or curved-line distances;	<ul style="list-style-type: none">– use the representative fraction of a map as a means of calculating distance and area;
<ul style="list-style-type: none">– use the distances chart on a road map to determine the distances between major centres;	<ul style="list-style-type: none">– use the distances chart on a road map to determine the distances between major centres;	
<ul style="list-style-type: none">– use the local distances provided on a road map to calculate distances between communities;	<ul style="list-style-type: none">– use the local distances provided on a road map to calculate distances between communities;	
<ul style="list-style-type: none">– establish relationships among time, distances travelled, and modes of transportation;	<ul style="list-style-type: none">– establish relationships among time, distances travelled, and modes of transportation;	
<ul style="list-style-type: none">– develop a conception of long distances (e.g., “The east-west distance across Canada is more than 5000 km” or “Mount Finlay is more than 3000 m high”);	<ul style="list-style-type: none">– develop a conception of long distances (e.g., “The east-west distance across Canada is more than 5000 km” or “Mount Finlay is more than 3000 m high”);	<ul style="list-style-type: none">– develop the concept of great distances, such as those expressed in descriptions of the solar system and of outer space;– describe precise ways of measuring great distances.
<ul style="list-style-type: none">– use distance and time to describe relative location.	<ul style="list-style-type: none">– translate distance expressed in degrees of latitude into kilometres;	<ul style="list-style-type: none">– use distance and time to describe relative location.
	<ul style="list-style-type: none">– relate longitude and time zones.	<ul style="list-style-type: none">– relate longitude and time zones.

Direction. A prime skill of map reading is the ability to orient a map and to acquire a sense of direction.

Grades 7–8	Grades 9–10	Senior Division
Students should be able to:	Students should be able to:	Students should be able to:
– use global directions (cardinal, intermediate, up and down);	.....	– describe how direction is described in space;
– relate east and west directions to the earth’s rotation;	.....	.....
– use relative direction correctly (e.g., up or down referring to altitude, to or from referring to travel or flows);	.....	– recognize direction applied in plan (from above) and in profile (horizontally);
– use general directions to describe the flow of a river (easterly), the trend of a mountain range (northeast to southeast), or the path of a jet stream (west to east);	.....	– relate the terms <i>clockwise</i> and <i>counterclockwise</i> to winds, pressure zones, and the coriolis force as applied to winds and ocean currents;
– relate cardinal directions to parallels of latitude and meridians of longitude;	.....	– compare different map projections to learn how the patterns of parallels and meridians differ;
– orient a map to a globe or a map to another map;	– orient a map to a map or a photograph to a map;	– orient a map by an inspection of features, both in the field and on the map; – orient a map by means of a compass;
– use a compass to determine direction;	.....	– express direction by angular bearings;
– locate north on a globe and on a variety of map projections.	– differentiate between true north and magnetic north.	– distinguish among true north, magnetic north, and grid north; – follow a given magnetic bearing in the field; – determine direction by using field expedients (e.g., a watch as compass, the stars to find true north).

Location. The absolute location of a place or region may be expressed by means of a grid system or within a world-wide or Canada-wide system. Relative location is concerned primarily with the location of a place or region in relation to other places or regions.

Grades 7–8	Grades 9–10	Senior Division
Students should be able to: <ul style="list-style-type: none">– locate their home community, county or district, Ontario, and Canada on a globe and on a variety of maps;– locate a place according to such physical conditions as landforms, weather, and natural vegetation;– locate a place when its latitude and longitude are known;– use an atlas gazetteer efficiently;– locate a place on a road map, using the index and the letter-and-number grid-reference system;– explain how the relative location of a place is determined on the basis of the following:<ul style="list-style-type: none">a) the streets in a community;b) the intersection of streets or highways;c) distance and direction from known locations (e.g., a large community, a distinctive physical feature, a well-known building or landmark);	Students should be able to: <ul style="list-style-type: none">..........– locate a place by means of a six-figure co-ordinate system (military grid);..........– interpret interrelationships among location, topography, climate, and their general influence on people;	Students should be able to: <ul style="list-style-type: none">– use a topographic map index to order or locate a desired map;.....– locate a place on a topographic map by its latitude and longitude to the nearest minute;.....– evaluate the advantages of a location for specific purposes (e.g., houses, cities, industries, crops, natural resources);– evaluate the advantages of a location, using criteria such as accessibility or amenity;

Location (continued)

Grades 7–8	Grades 9–10	Senior Division
– describe the relative location of such features as dams, highways, airports, and communities;	– describe the global location of places through descriptions of major water boundaries, neighbours, hemisphere or continental location, distance and direction from major countries or cities, and latitudinal comparisons with other countries;	.....
– locate their home community in worldwide or Canada-wide location systems (e.g., time zones or postal zones);	– describe the worldwide system of time zones and its uses;	– determine the latitude of their home community by determining the altitude of Polaris;
	– describe the North American area-code telephone system and its uses;	– describe the Canadian system of coding topographic maps.
	– describe the Canadian postal-zone system and its uses;	.....
– locate their home community in a political or administrative sense (by township, county, region, district, province, and country).	– locate communities in a political or administrative sense (e.g., by ward, riding, township, county, district, province, state, country, as well as by worldwide political, economic, and military alliances).	.....

Symbols. Symbols are the shorthand of mapping. They allow the cartographer to identify features and show them in their proper locations.

Grades 7–8	Grades 9–10	Senior Division
Students should be able to:	Students should be able to:	Students should be able to:
– use map legends or keys to interpret various maps;	.....	.....
– identify three functional types of symbols:	– understand that symbols are of two types:	.....
a) point: an actual drawing of a specific thing such as a bridge, dam, tower, or church;	a) those that represent actual things in the field (e.g., highways, power lines, railways, rivers, forests);	
b) line: a variety of lines to denote roads, boundaries, power lines, and landforms;	b) those that represent features that cannot be seen in the field: isolines such as contour lines and boundaries (e.g., between landform regions and socio-economic regions);	
c) area: colour and <i>pattern</i> to indicate features such as lakes, forests, soils, and time zones;		
– recognize that certain colours are assigned specific uses by cartographers (e.g., blue for water, red or black for features of the built environment, green for vegetation);	– recognize that certain colours are set aside for specific uses by the map maker (e.g., that the international colour scheme is the guide used by most cartographers to show elevation and altitude);	.....
– recognize the use of typography (e.g., different type sizes to indicate the relative importance of places);	.....	.....
– relate a land area to map-layer tints to determine its elevation;	– recognize a number of ways of showing land surface elevations on a map (e.g., relief drawing, layer tinting, spot heights, contour lines, benchmarks);	– demonstrate how contour lines can be derived from spot heights;
– use map-layer tints to determine water depth;		– demonstrate how a profile can be derived from contour lines.
– draw sketch maps to highlight information found in field studies and from map studies.	– depict geographic information neatly and accurately on outline and sheet maps.	.....

Pattern. The geographer continually searches for repetitions or trends that form a pattern. Many maps, charts, and tables show patterns.

Grades 7–8

Students should be able to:

- identify features that have a characteristic shape or pattern (e.g., natural features such as lakes, rivers, and wooded areas; built features such as airports, roads, storage tanks, and buildings);

- use maps that show patterns by means of colour, dots, and shading.

Grades 9–10

Students should be able to:

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- interpret maps that show patterns in a variety of ways, including graphs and text.

Senior Division

Students should be able to:

- interpret maps that show a variety of patterns, including capability (recreation), land use, flow, and change (as illustrated by a map series);
- draw maps that show patterns in a variety of ways, including graphs, text, and flow;
- determine how the information found in satellite images is gathered and converted into a form resembling a photograph;
- describe the uses made of satellite images.

Observation and research techniques. Geographic investigation requires the gathering of information in systematic ways, such as through field studies and the analysis of ground photographs, air photographs, and topographic maps.

Grades 7–8	Grades 9–10	Senior Division
<p>Students should be able to:</p> <ul style="list-style-type: none">– under direction, observe, collect, record, classify, and report data gathered from the local neighbourhood;	<p>Students should be able to:</p> <ul style="list-style-type: none">– under direction, observe, collect, record, classify, and report data gathered from the local community and region;	<p>Students should be able to:</p> <ul style="list-style-type: none">– plan and carry out independently a field study to obtain primary data;
<ul style="list-style-type: none">– gather information, using well-planned interview techniques, in the school or neighbourhood;	<ul style="list-style-type: none">– gather information in the school or neighbourhood, using well-planned interview techniques and interviews with guest experts by appointment;	<ul style="list-style-type: none">– gather information, using a stratified sample and a biased sample;
<ul style="list-style-type: none">– examine pictures and photographs in a systematic way to determine styles of clothing, landscape features, styles of houses and other buildings, action (e.g., what is going on, what occupations people are engaged in), the languages used on signs, the level of technology, the influence of other cultures, similarities to and differences from other regions (especially the local community), and other clues;	<ul style="list-style-type: none">– interpret photographs, that is, use the features shown to develop hypotheses and explain relationships;	
<ul style="list-style-type: none">– examine vertical and oblique air photographs in a systematic way:<ul style="list-style-type: none">a) by orienting the photograph to a map;b) by identifying cultural and natural features through a consideration of clues such as shape and surrounding area;	<ul style="list-style-type: none">– examine vertical and oblique air photographs in a systematic way:<ul style="list-style-type: none">a) by orienting the photograph to a map;b) by determining the date of the photograph;c) by determining the areas covered by the photograph;d) by identifying cultural and natural features through a consideration of clues such as shape, surrounding features, the size of features not recognized in relation to features known, pattern (repetitions in the landscape), shadows, shade or texture, and areas of water, vegetation, or crops;	<ul style="list-style-type: none">– interpret vertical and oblique air photographs in a systematic way, using clues such as the following to make relationships: location, scale, physical features (e.g., drainage, landforms, natural vegetation, soils, climate), cultural features (e.g., settlements), transportation and communications (e.g., roads, railways, airports, power lines, communication towers), and economic activities (e.g., evidence of fishing, forestry, mining and quarrying, tourism, recreation, agriculture, distribution systems), their importance, and their relationships with physical and cultural features;

Observation and research techniques (continued)

Grades 7–8	Grades 9–10	Senior Division
– use air photographs as a primary source of information;	– identify patterns of features on an air photograph;	– examine air photographs in a systematic way, using stereograms and a stereoscope;
	– recognize the strengths and weaknesses of air photographs;	– discuss the differences between air-photograph identification and air-photograph interpretation;
– recognize two major types of air photograph – vertical and oblique – each with its own uses and limitations.	– recognize two types of oblique air photograph – low and high – each with its own uses and limitations;	.....
	– use topographic maps to determine direction and elevation, locate features precisely, recognize degrees of relief, identify common landform and cultural features by shape and symbol, draw profiles and transects, and identify relationships between relief and land use.	– interpret topographic maps in a systematic way, using clues such as the following to determine relationships: location, marginal information, broad patterns, drainage, landforms (e.g., range of altitude), vegetation, climate, soil, slope or drainage, climate, cultural features (e.g., settlements), transportation and communications, economic activity, history of settlement.

Charts, graphs, and tables. Charts, graphs, and tables are ways to translate and communicate information and quantifiable data into forms that reveal patterns and relationships. While it may not be possible to include all forms in a single geography course, the suggestions in this section reveal the wealth of interesting types that are available.

Students can use computers to process data quickly, illustrate them in various forms, and thus aid in their analysis and explanation.

Grades 7–8	Grades 9–10	Senior Division
Students should be able to: <ul style="list-style-type: none">– secure information from a wide variety of graphs (e.g., line, multiple-line, horizontal-bar, vertical-bar, and divided-circle graphs);– with considerable teacher direction, construct graphs to illustrate patterns in a set of data;– interpret (and possibly construct) graphs such as the following: line (e.g., to show population over time); multiple-line (e.g., to show birth and death rates over time); vertical-bar (e.g., to show Canada’s population by province for one year); horizontal-bar (e.g., to show the longest rivers of the world); compound-bar (e.g., to show a country’s imports by major categories); divided-circle, circle, or pie (e.g., to show the share of coffee production by country);– secure information from charts and tables such as the following: schedules (e.g., bus, rail, airline), comparison charts (e.g., those comparing two countries in many categories), retrieval charts (e.g., information on a single culture), statistical tables (e.g., demographic information for a number of countries);	Students should be able to: <ul style="list-style-type: none">– interpret information obtained from complex graphs such as comparative-bar or proportional-circle graphs;– with some teacher direction, choose a suitable method and scale for graphing a set of data;– interpret (and possibly construct) graphs such as the following: comparative-bar, or multiple-bar groups (e.g., to show Canadian sources of energy for consecutive years); divergent or positive-negative bar (e.g., to show the balance of trade over time); percentage bar (e.g., to show the products of a farm); proportional-circle (e.g., to show city population by location and size);	Students should be able to: <ul style="list-style-type: none">– with minimal teacher direction, choose a suitable method and scale for graphing a set of data;– interpret (and possibly construct) graphs such as the following: divided-circle (e.g., to show the male-to-female ratio in the total population); semi-log (e.g., to show automobile production since 1900); age-and-sex or population pyramid (e.g., to show the demographic structure of a country at a specific time);

*Charts, graphs, and tables (continued)***Grades 7–8**

– with teacher direction, construct a table, chart, or pictogram to illustrate a set of data, for example, to compare the areas of several countries or to show the number of houses built over a period of years;

– interpret (and possibly construct) graphs and diagrams that show weather and climate, such as the following: bar and line climate graphs (e.g., to show the climate of a station over time), cumulative climate graphs (e.g., to compare the climates of a number of places), diurnal graphs (e.g., to describe daily temperature patterns for a month), circle calendars (e.g., to relate farm activities to specific months and climatic conditions).

Grades 9–10

– apply simple statistical-analysis tools (e.g., per capita, per cent, mean, and median) in analysing a set of data;

– see that, while data may be translated into many forms, there is often a “best” form for a particular use.

.....

Senior Division

– apply sophisticated statistical-analysis tools (e.g., range of values, standard deviation, Z-scores, correlation);

– select the best mode to communicate information that involves any of the following:

- relationships;
- volume or quantity;
- inferences;
- change;

– interpret and construct graphs and diagrams that provide information about weather and climate, such as the following: circular climatic graphs (e.g., to emphasize an area’s climate by seasons), ergographs (e.g., to relate farm work to seasons), hythergraphs (e.g., to classify a climate and compare it to what is considered comfortable), wind roses (e.g., to show wind directions over a period of time), weather stations (e.g., to show weather-related data on weather maps).

Diagrams and models. Diagrams and models make it possible to present complex relationships and interactions in simplified forms. By showing the effect of a mix of variables, they can make patterns clear and make it possible to generalize about possible causes and effects.

Grades 7–8	Grades 9–10	Senior Division
Students should be able to: <ul style="list-style-type: none">– explain a diagram showing the organization of the local government or a company;– explain a simple model showing the flow of raw materials through a manufacturing process;– gather information about traffic in a neighbourhood; translate the data into a traffic cartogram; and use the model as a basis for discussion;	Students should be able to: <ul style="list-style-type: none">– explain a diagram showing the organization of a multinational corporation;– determine whether the local community uses a model in its planning process; <div>.....</div>	Students should be able to: <ul style="list-style-type: none">– interpret models that try to predict the present and future spheres of influence of a city;– locate models that have been drawn for specific purposes, such as recreational or land capability;– use a mathematical model (e.g., to determine the retail breaking point between two cities);– use models to illustrate systems and processes, such as input-output systems, closed systems and cycles, trade flows;– discuss the value of a model or theory, such as those put forward by Von Thunen or Christaller;
– interpret diagrams such as the following: field sketches (e.g., of local landforms), flow-line diagrams (e.g., to show the sequence of steps in making steel), special-purpose diagrams (e.g., to show orographic rainfall).	– interpret (and possibly construct) diagrams such as the following: block diagrams (e.g., to show volcanic regions), proportional-circle or square diagrams (e.g., to compare the size of several cities).	– interpret and construct diagrams such as the following: scatter (e.g., to relate the literacy rates of nations to their gross national product), transect (e.g., to show vegetation zones across a particular distance), profile or cross section (e.g., to show a land surface as viewed from the side), plan (e.g., to show a land surface as viewed from above).

Time and chronology. Space and time form a framework within which all events can be placed. Human activities and cultural patterns are related to geographic information such as location and accessibility, as well as to the particular time in which people live.

Grades 7–8

Students should be able to:

- distinguish between time and chronology;

- explain the relationship between the rotation of the earth and night and day;

- explain the relationship between the earth's revolution around the sun and the calendar year and seasons;

- associate seasons with particular months in both the northern and southern hemisphere.

Grades 9–10

Students should be able to:

- acquire a sense of historic time;

- explain the system of time zones as related to the rotation of the earth;

- interpret seasons as they are shown in a wide variety of climate graphs;

- use a sequence of maps to show Canada's area and growth from Confederation to the present;

- use a time line to relate Canadian immigration to world events.

Senior Division

Students should be able to:

- describe several cycles in nature, including the water cycle, a food chain, and mountain building;
- attach some form of time and chronology to continental drift and the geologic cycle;

- explain the cyclic nature of certain weather occurrences (e.g., monsoon and harmattan winds, hurricanes);

- explain the term *sequent occupance* and provide several examples of it.

Research. A great many of the activities and skills in this appendix relate to this final topic of research. This section provides a checklist of many of the more important technical aspects of research with which students should be familiar.

Grades 7–8

Students should be able to:

- undertake research using:
 - a) the components of books (e.g., title page, table of contents, index, copyright date, glossary, appendixes, map lists, illustration lists);
 - b) sections of atlases (e.g., table of contents, appropriate map(s) for the task, statistical information, glossary, gazetteer);
 - c) encyclopedias (students should become familiar with the index, key words, and cross-references);
 - d) simple data bases;

- evaluate various sources of data for a specific purpose.

Grades 9–10

Students should be able to:

- undertake research using:
 - a) various parts of a book to locate information (e.g., glossary, appendixes, map list, illustration list);
 - b) library facilities (e.g., the catalogue, periodical index, vertical files);
 - c) data bases;

- use and develop short bibliographies;

- use references and footnotes in their own writing.

Senior Division

Students should be able to:

- undertake research using:
 - a) the full resources of modern libraries (e.g., newspaper and magazine indexes, vertical files, microfilm, data bases such as INFO GLOBE);
 - b) publications such as *Facts on File*;

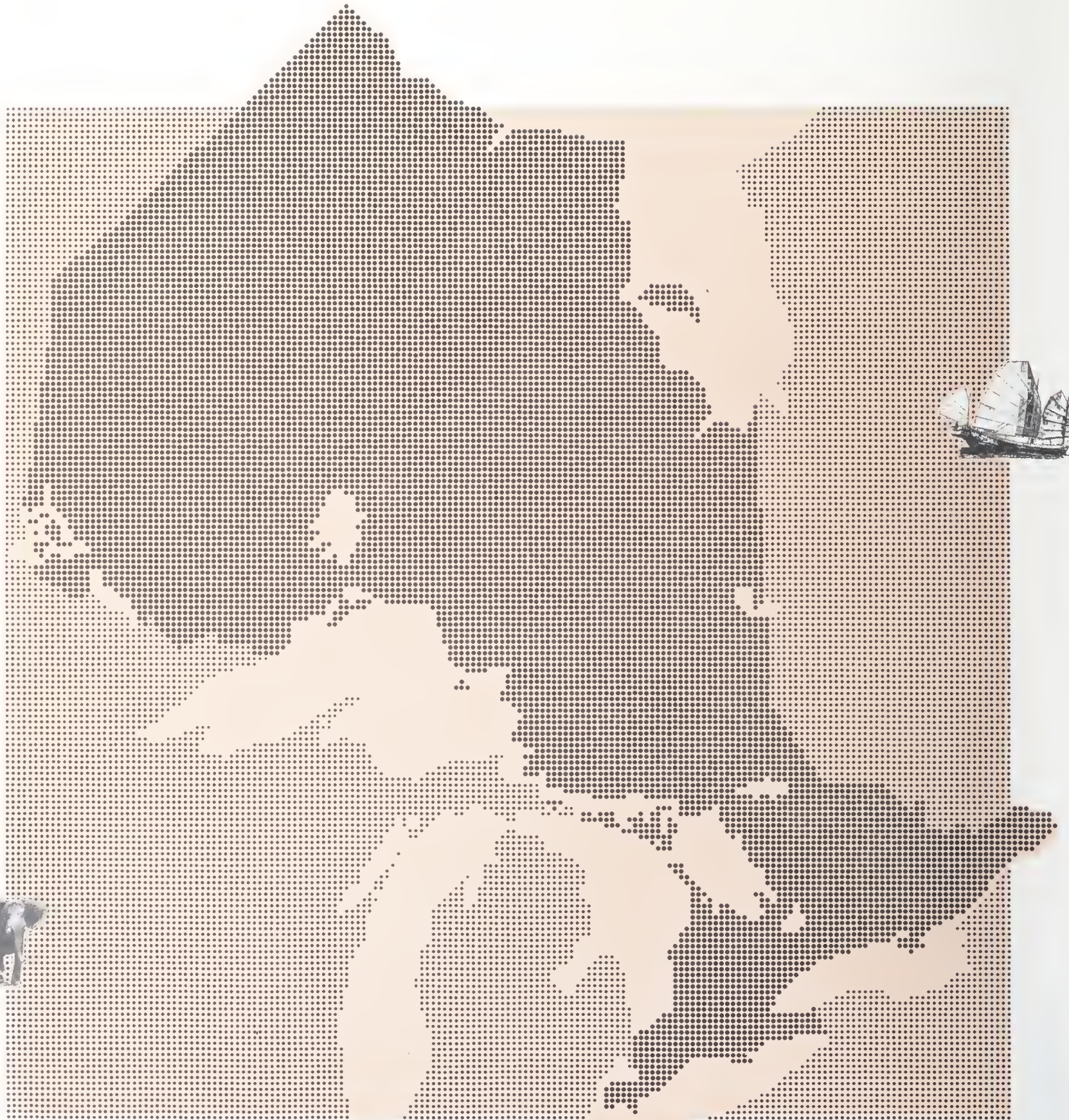
- rank bibliographies according to reliability.



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GEOGRAPHY



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